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The arrangement of chapters and the development of the subject is practically the same in both, as might be expected, in view of their common authorship. But further than this, whole phrases and sentences are to be found everywhere which furnish parallel readings with but slight verbal alterations. A frank acknowledgment of this parallelism, though not a matter of primary importance, might have been of considerable assistance to some readers. On the whole, the verbal changes referred to are in the interest of conciseness and smoothness of diction, and the limiting of discussion in the 'Outline' to a few salient points makes the presentation clearer and more acceptable to the ordinary student. Assuming the general identity of standpoint of the two works, we need do no more than point out their most striking differences. In the earlier work the chapter on Impulse, Instinct and Desire is placed after the treatment of perception, reasoning and the emotions, and just before the will. In the 'Outline' it is advanced to the first place in the part devoted to the Development of Mental Life, so that it precedes even the discussion of Perception. This is a notable indication of the larger prominence which the 'motor consciousness' is obtaining in psychology.

A chapter is added in the 'Outline' on the relation between mind and body. The author eliminates the metaphysical side of the topic, which he has discussed in his *Philosophy of Mind*, while the treatment of the scientific aspect may be considered an advance on the position taken in his two works on physiological psychology.

The genetic standpoint is emphasized more than in any of Professor Ladd's previous works, while laboratory psychology is given more space and greater importance, relatively, than in the larger descriptive psychology. Diagrams occur frequently to illustrate both particular experiments and curves of general results. In connection with the latter, it should be noted that the diagrams on pages 84 and 85, which are given for the purpose of exhibiting the difference between Weber's and Fechner's statements of the psycho-physical law, are rather misleading; the axes of sensation and stimulus are reversed in the two drawings, making the

curves difficult of comparison, and, moreover, the interpretation of the horizontal distances (sensation increments) in the first diagram is somewhat open to question. The psycho-physical law itself is stated (in italics) as follows: "For any given class of sensation the least noticeable difference is a constant fraction of the sensation" (p. 83). A slip of this character is unusual in so careful a writer as Professor Ladd.

It is scarcely in place here either to approve or to criticise Professor Ladd's general positions, which are too well known to call for any special review. The distinction between processes and development of mental life forms the basis for a two-fold division of the work. The author reminds us in his preface that experiment has been most frequently and successfully applied to the elementary phases of mental life, and that it has accomplished but little in the higher types of psychical process. The same position is maintained in the body of the work, where references to experimental results are largely confined to the first part.

As indicated by the title, the 'Outline' is a 'descriptive' treatment of psychology. The omission of detailed 'explanatory' portions, which appear in the larger work, make it available for general class-room work, and in this sphere it will doubtless prove of extreme value. Page references to well-known authorities are given at the end of each chapter, supplying a more detailed treatment for those who wish it.

H. C. WARREN.

SCIENTIFIC JOURNALS.

American Chemical Journal, April. 'An Investigation of some Derivatives of Orthosulphobenzoic Anhydride:' By M. D. SOHON. The author studied the action of alcohol, phenols, ammonia and amines on the anhydride and obtained esters, phthaleins and other derivatives which were well characterized. A series of sulphonic acids isomeric with the sulphaminebenzoic acids was obtained. 'Iodometric Estimation of Tellurium:' By J. F. NORRIS and H. FAY. The authors oxidize the tellurous acid with potassium permanganate, estimate the excess of the latter with potassium iodine and sul-

phuric acid and determine the iodine set free by sodium thiosulphate. 'The Relation of Trivalent to Pentavalent Nitrogen:' By A. LACHMAN. Preliminary study of the reactions of nitrosamines. 'On Paramethoxyorthosulphobenzoic Acid and some of its Derivatives:' By P. R. MOALE. 'Decomposition of Paradiazoorthotoluenesulphonic Acid with Absolute Methyl Alcohol in the presence of certain substances:' By P. R. MOALE. The decomposition was studied in the presence of sodium methylate, ethylate, potassium hydrate, ammonia and aniline. 'Parabenzoyldiphenylsulphone and related compounds:' By L. C. NEWELL. 'The Action of Ethylic Oxalate on Camphor:' By J. B. TINGLE.

J. ELLIOTT GILPIN.

SOCIETIES AND ACADEMIES.

GEOLOGICAL SOCIETY OF WASHINGTON.

At the 77th meeting, held in Washington, D. C., on April 13, 1898, Mr. J. A. Taff, U. S. Geological Survey, discussed the 'Geology of the McAlister quadrangle.' This quadrangle covers a quarter degree in northwestern Choctaw Nation, Indian Territory. Its geology is practically a duplication of the western Arkansas coal field and older Carboniferous rocks. The coal-bearing rocks, shale, sandstone and coal occupy the northwestern half of the quadrangle and are nearly 6,500 feet thick. Two productive coal beds have been developed. One, the Hartshorn or Grady coal, is at the base, and the other, the McAlister coal, is about 1,350 feet higher in the series. Each is about four feet thick and produces a good strong coal. Sandstone, shale and limestone occur below and south of the coal-bearing rocks and have an aggregate thickness of nearly 1,800 feet. The structure is Appalachian. That of the coal field is canoe-shaped synclines and unsymmetrical anticlines. The rocks south of the coal field are greatly faulted and intensely folded. The faults are overthrust and the folds overturned toward the north. The displacement of the greater faults are estimated to be from 7,000 to 10,000 feet.

Under title, 'The Probable Age of the McAlister Coal Group,' Mr. David White presented a

synopsis of the results obtained from a study of the fossil plants of the McAlister, I. T., coal field. The flora of the Grady or Hartshorn coal he finds to indicate a reference to the 'Lower Coal-bearing Division' of Winslow, or the basal portion of the Upper Coal Measures of Branner and Smith, in Arkansas, and a stage near the base in the Allegheny Series of the Ohio-Pennsylvania bituminous regions. The plants of the McAlister coal, about fifteen hundred feet above the Grady coal, assure a correlation with the 'Upper Coal-bearing Division' of Winslow, in Arkansas, a stage, perhaps near the Lane Shales, in the lower half of the Missourian, in Arkansas, probably below the Pittsburg coal in Pennsylvania, or near coals F or G of the Northern Anthracite field. Vegetable remains, collected by Messrs. Taff and Richardson from an horizon about two thousand feet above the McAlister coal, constitute a distinctly Coal Measures flora, without any characteristic Permian species, and bespeak a remarkable expansion of the Upper Coal Measures, or Missourian, in the Indian Territory coal field, such as is perhaps comparable to the great dialation of the Lower Coal Measures in the Central Appalachian region.

The last paper was by Mr. H. W. Turner on 'The Succession of the Igneous Rocks of the Sierra Nevada.'

In Jura-trias time in the northern Sierra Nevada volcanoes poured forth acid lavas, meta-rhyolites and meta-dacites. These acid lavas were followed by more basic lavas, meta-augite-andesites (augite-porphyrites). The succession is here clearly: first, acid; second, intermediate to basic lavas. During nearly all of Cretaceous time, and perhaps also during the Eocene, the volcanic forces of the Sierra Nevada were quiescent. The first Tertiary eruptions of large volume of which there are records were rhyolite. After another but shorter period of rest, during which the rhyolitic lavas were partly eroded, the volcanoes emitted vast floods of andesite. This succession does not accord with the theory proposed by Iddings, that the first eruption of a given volcanic center are of intermediate lavas followed by lavas more acid or more basic, or both.

WM. F. MORSELL.